BOLD THINKERS DRIVING REAL-WORLD IMPACT

Is there a continuing role for biofortification to address micronutrient deficiencies? *An agriculture-nutrition tool to identify contexts in which biofortification has an important role to play.*

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Identifying micronutrient interventions

Food based –
addresses underlying causes

- Biofortification
  Targeted and agronomic
- Dietary diversity

Public Health –
treatment for deficiency

- Fortification
- Supplementation
- Point of use

Recommended for addressing high micronutrient deficiency

Evidence on micronutrient interventions

Interventions	Efficacy	Reach	Cost effectiveness (per year)
Biofortification	Established	Emerging evidence	Emerging evidence
Supplementation	Established evidence for vitamin A and iron; Not recommended for zinc as preventive	Established for vitamin A and iron	Established for vitamin A and iron
Fortification	Established for vitamin A and iron	Established for vitamin A and iron	Established for vitamin A and iron
Micronutrient powder	Emerging for iron and vitamin A	Emerging evidence	Emerging evidence
Dietary diversity	Emerging evidence	Not established	Emerging evidence

Relative potential of interventions

Supplementation has a parallel role to play to meet the needs of specific vulnerable populations, therefore we do not consider it further

Fortification can cost-effectively reach populations that consume fortification vehicles

Biofortification has relative advantage reaching those that cannot access fortified foods, and/or have limited access to nutrient rich foods

Interventions that improve quality and diversity of diets should be a long-run strategy as they address the underlying cause of deficiency

All this means that context matters in choosing the right mix of fortification, biofortification and dietary diversity interventions…

- There is a **Fortification Assessment Coverage Toolkit (FACT)** that helps determine the potential for fortification
- And a **Biofortification Prioritization Index (BPI)** that helps determine the potential for biofortification
- Harvest plus's portfolio analysis work has considered several combinations of biofortification and fortification interventions to assess micronutrient deficiency, but using prospective analysis
- **B-FACT** considers the potential for the two side by side in a snapshot similar to FACT

Biofortification-Fortification Assessment Coverage Toolkit-B-FACT tool

- **Considers fortification coverage alongside biofortification**, with information on consumption of micronutrient rich foods
- **Allows nutrition and agriculture teams to plan jointly** supporting multi-sectoral approach to addressing micronutrient deficiency
- **Supplementation is not included** since it must continue in parallel for severely deficient populations

Using qualitative and quantitative data B-FACT assesses…

- Percentage of population that consumes
  - Fortifiable or fortified products
  - Micronutrient rich foods
  - Crops that they grow themselves, or source locally
- Percentage of population that has low dietary diversity, no access to fortifiable products but who consume crops grown locally --- biofortification has greatest potential to reach these populations

Biofortification's potential for scale in Eastern Uttar Pradesh, India

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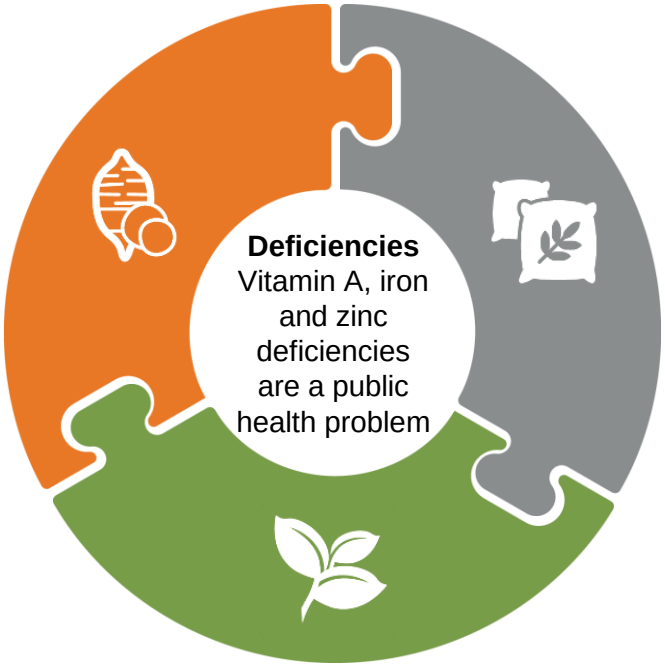
India’s context: Eastern Uttar Pradesh Region

Biofortifiable crops

- **Zinc wheat and rice**
- **Iron pearl millet**
- **Lentils**

Dietary diversity

- **Poor access to iron and zinc** rich foods
- **Better access to Vitamin A** rich foods *(mangoes, papaya, green leafy vegetables)*

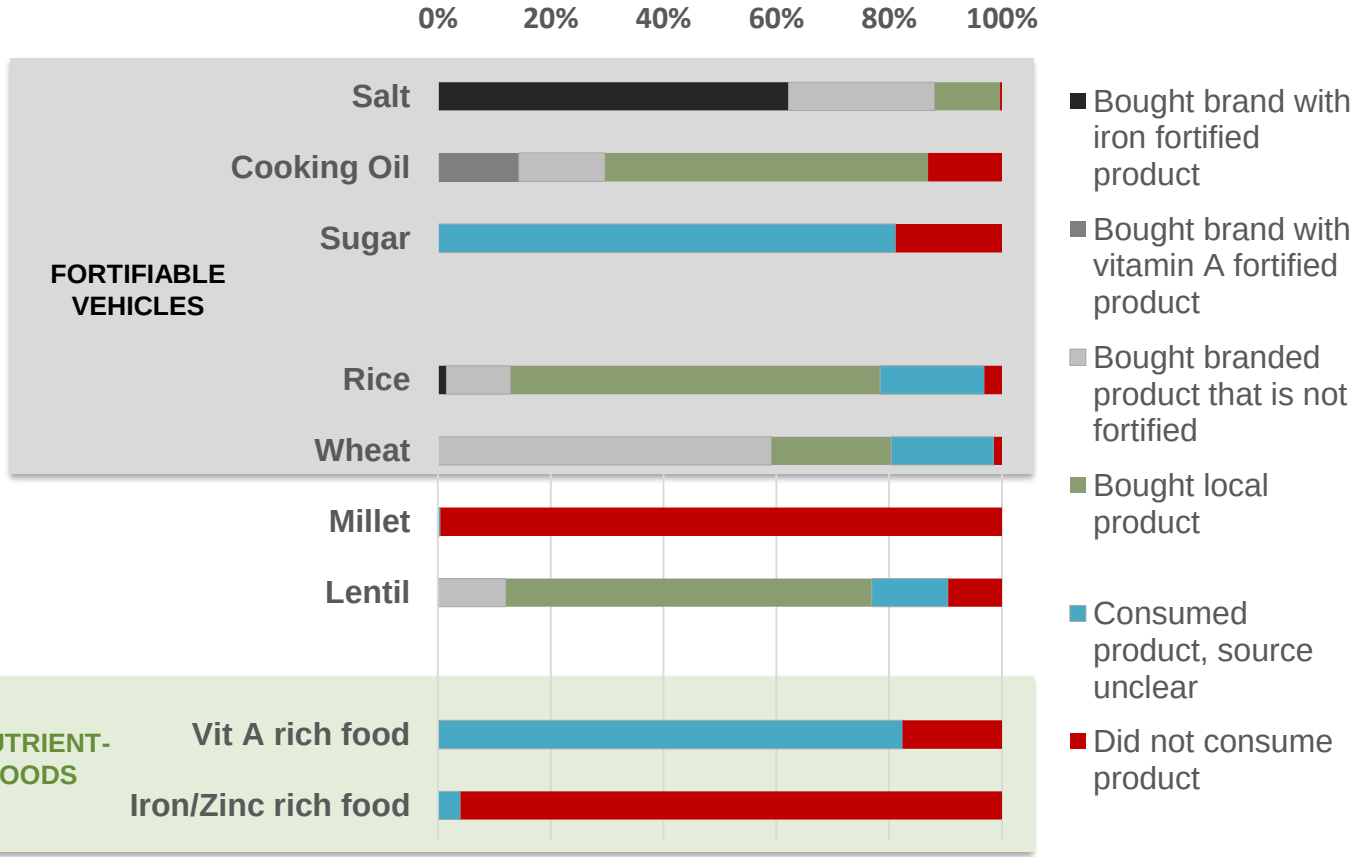


Fortification vehicles (voluntary)

- **Wheat flours, rice** *(iron, folic acid, vitamin B12)*
- **Oil and milk** *(vitamin A, vitamin D)*
- **Salt** *(iodine, iron)*
  - ✓ Mandatory for school meals and public distribution systems beginning 2019
  - ✓ Double-fortified salt is not preferred by households

Eastern UP (Rural): Consumption of micronutrient rich foods, fortification vehicles, and biofortifiable crops

- High consumption of Vitamin A rich foods with dairy as the primary source of Vitamin A rich foods
- Almost no consumption of iron and zinc rich foods
- High consumption of fortifiable foods
- Greatest potential for biofortified foods is for rice and wheat



Source: Ipsos, 2016

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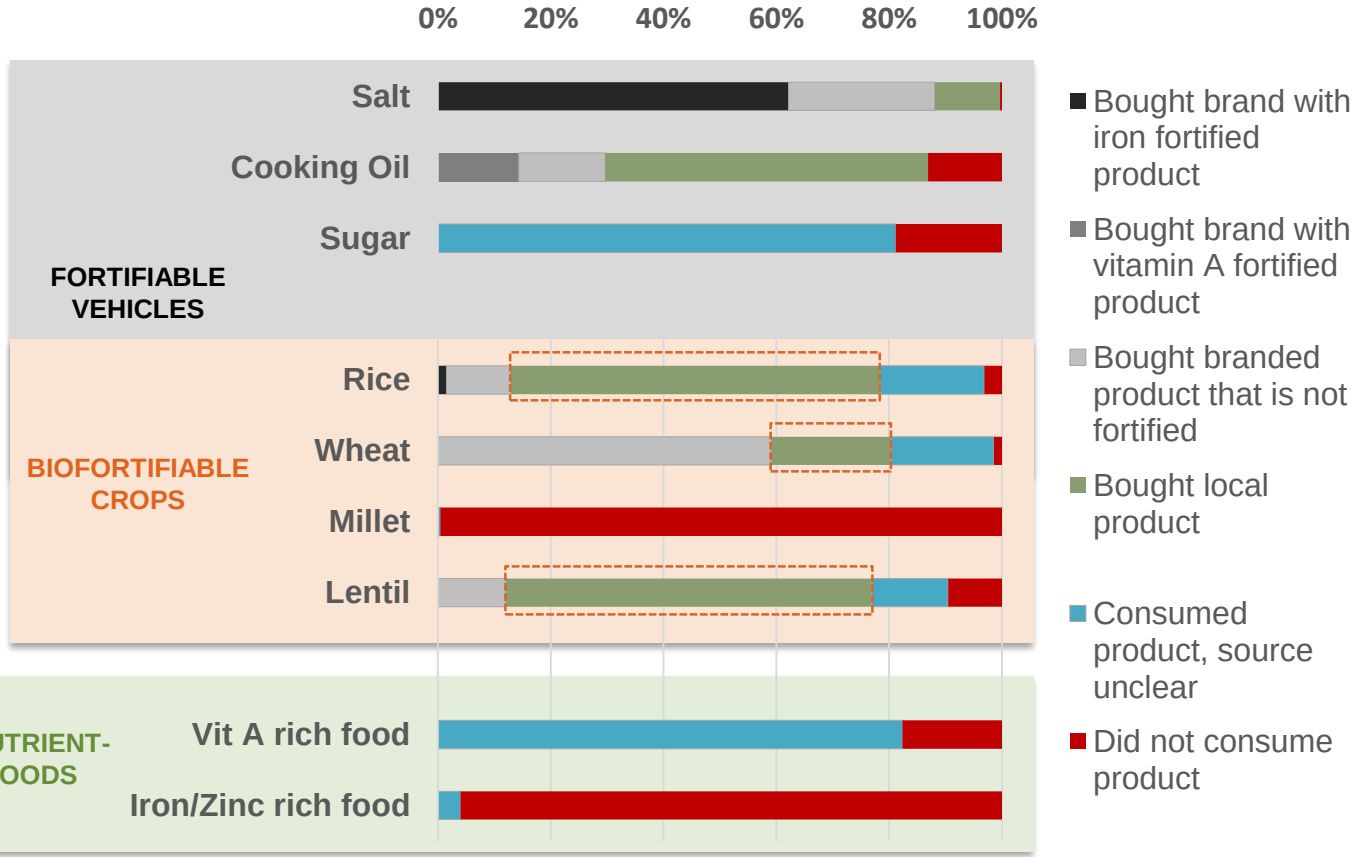
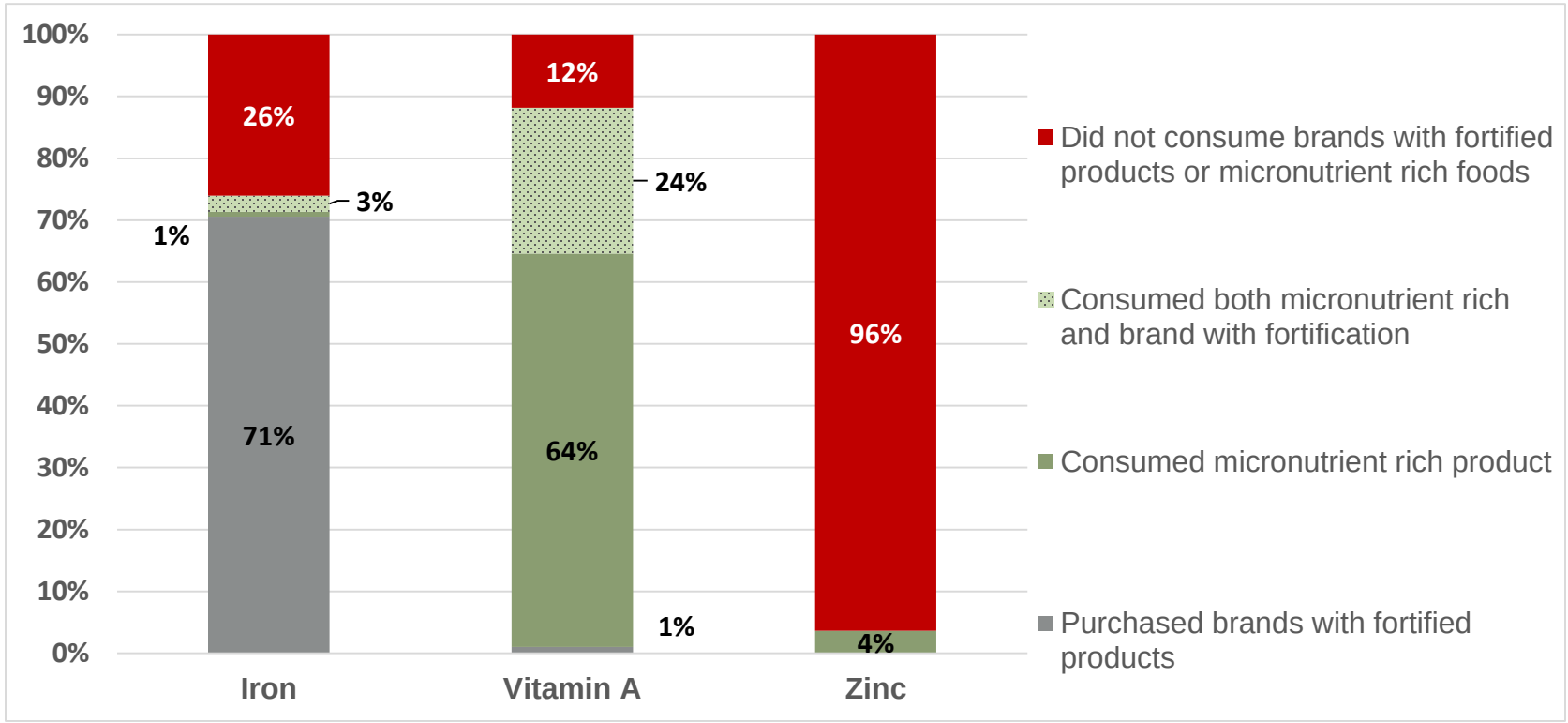
- Greatest potential for biofortified foods is for rice and wheat, millet not consumed in Eastern UP

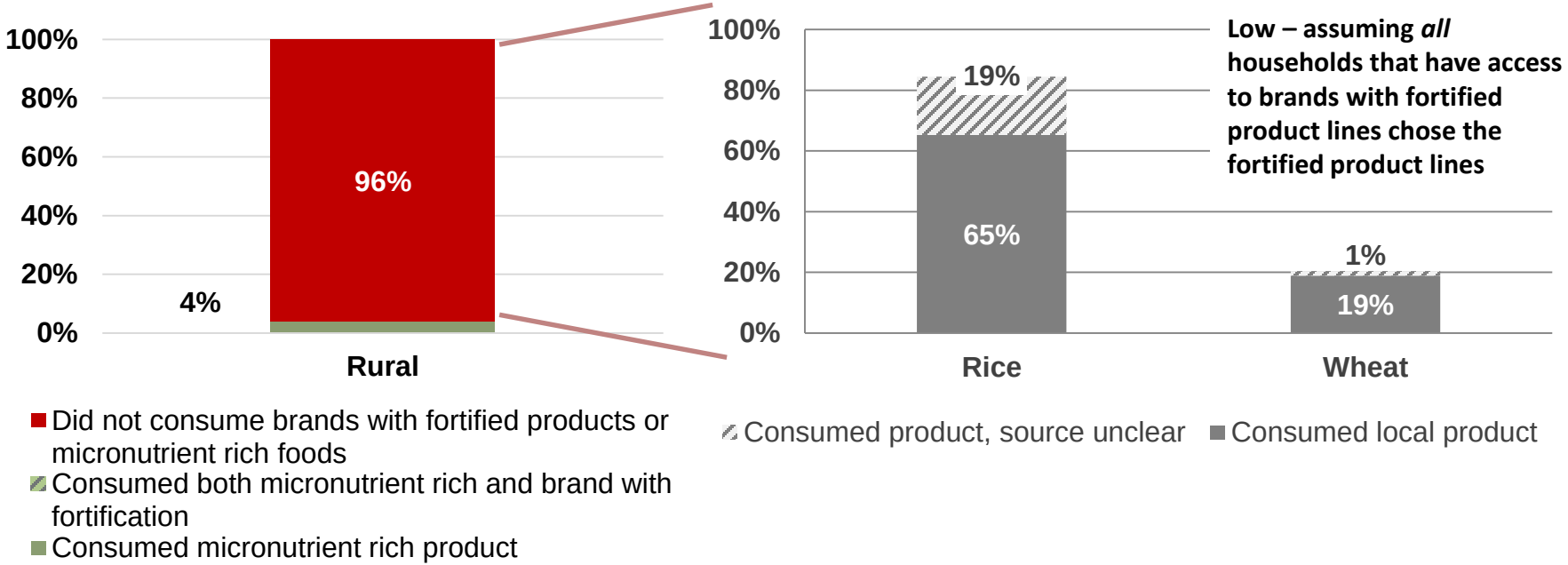


Source: Ipsos, 2016

Coverage gaps in India: potential for biofortification



Highest potential for biofortification is in addressing zinc deficiency



Among 96 % of rural households with no access to zinc fortified products or zinc-rich foods:

- Rice bio-fortified with zinc would reach 84% of rural households
- Wheat biofortified with zinc would reach 20% of rural households

Key recommendations for addressing micronutrient deficiencies:

- Mix of micronutrient interventions needed; context is key
- The potential for biofortification's impact is greater in scaling up iron- and zinc-biofortified crops
- When fortification standards are voluntary, there is a greater role for biofortification since behavior change constraints exists even for fortification
- Large gaps exists in access to micronutrient rich foods which need to be addressed

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